# Hypline Innovations

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### **Meeting the Challenge of Cage-Free Egg Production**

In many parts of the world, farmers are responding to the increasing demand for eggs produced from cage-free layers. While this may be a daunting prospect for those producers with their roots in more intensive housing systems, the results from cage-free flocks demonstrate that with the appropriate management, production levels can match the results achieved in cage systems.

The management process starts with the rearing cycle. It is important to match the rearing system as closely as possible to the environment the birds will experience in the laying house. Many cage-free layers will be housed in aviary systems; therefore, it is important that pullets have learnt



from a young age to navigate through the overhead equipment. This will be best achieved by rearing the flock in an aviary rearing system, but where this is not available, floor rearing systems should be fitted with aerial platforms and perching, with a proportion of the feed and water raised off the floor.

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### Investing in the Future: A Message from the President

Dear Friends and Colleagues of the World Egg Supply Chain,

Reflecting on the first half of 2024, I want to extend my heartfelt gratitude for your dedication and resilience amidst the challenges faced by global egg producers and layer chick suppliers. Managing ongoing supply challenges due to HPAI remains a constant focus. Australia is now dealing with new outbreaks after years without it affecting the commercial poultry industry.

At Hy-Line International, our enduring commitment is to assist you in the egg supply chain by enhancing chick and egg output sustainably. Our researchers continue to focus on developing balanced, productive varieties at both the commercial layer and breeder levels, to improve the supply chain, and ensure we meet the demands of our partners and customers worldwide.

In this edition of Innovations, I am excited to update you on our ongoing efforts for continuous improvement. Our new pedigree farm in Brazil is operational, with the first selections taking place in August/September this year. This initiative enhances our ability to develop the best layers for global markets and diversifies our supply chains, mitigating risks to our elite breeding stock.



Hy-Line President Jonathan Cade

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In May 2024, we hosted a technical school in Lusaka, Zambia, bringing together world-class experts to share their knowledge and insights, as part of our ongoing commitment to fostering innovation and collaboration within our industry.

Our research and technical team provided valuable insights and support during the Hy-Line North America Technical School in June 2024. Focusing in areas such as egg quality, feed mill operations, diagnostic lab procedures, lighting programs and more.

You will gain valuable insights to optimize your operations, including expert tips on cage-free production, top flock performance and the latest updates on vitamins and minerals, all in this edition of Innovations.

As a strategic partner in the global egg supply chain, Hy-Line is dedicated to continuous investment and efforts in highquality, productive, and efficient laying genetics. We are here to support you every step of the way as we work together to overcome challenges and achieve success.

Thank you for your continued partnership and trust in Hy-Line International. Together, let's make the rest of 2024 a year of success and growth.

Janatha Cade

#### Cage-Free continued from p. 1

Feeder and drinker type should also match those in the laying While house. this concept seems simple, it is one that is often overlooked, making transition the from rearing to laying farm even more challenging for the pullet. A poor transition to the production house may lead to a body weight loss of up to 10 percent,



and it is estimated that it may take the bird five weeks to fully recover the loss.

In a light-controlled environment, pullets will have generally been reared on a 10-hour day. On transfer, which is usually at 16 weeks, the addition of one hour to 11 hours of total light will stimulate feed and water intake and will help the process of regaining that lost body weight. How and when additional hours of light are added will depend on several factors, including the control over natural daylight, the body weight of the pullets, and the target egg weight. In contrast to cages where 14 hours of light is often the norm, birds in alternative systems may need a longer day length (up to 16 hours) due to the extra activity involved and to give them time to consume sufficient feed.

One of the most crucial aspects of successful cage-free production is encouraging the birds to use the nests, and that process must start immediately after housing. The three-week period after housing and before first egg is a good time for the birds to find and explore the nests. With that in mind, soon after housing, the birds should be given access to the nests which will encourage the birds to find and explore them. Temporarily lifting some nest curtains will aid this process.

During this "pullet training," nests should be closed two hours before lightsout, timing it with the last run of the feeder. Another important aspect is ensuring that the birds learn to go up onto the slats or system to roost. If they have been reared in an appropriate environment, this should come naturally;

however, any birds that are still on the floor at lights-out should be lifted up onto the slats.While this can seem like an overwhelming task, the birds will very quickly learn.

Lifting curtains initially will help birds find the nest.



By ensuring that the birds are 'going up' at night, this means that they wake up next to the feed, water and, crucially, the nest boxes. Once laying commences, birds should be "walked" regularly, while taking care not to disturb them in the nests. "Walking the birds" means having a worker enter the barn and walk through the flock to keep birds from settling in areas where they may be tempted to lay eggs, particularly against the sides of the building, in corners, or in any darker areas. Floor eggs should be collected frequently to discourage other birds from imitating this behavior.

Birds will need ample opportunity to feed, which means running feeders five or six times a day. The first feed should be at lights-on, or shortly after, then a gap of four

hours should be left before a further feed. This is done to avoid the feeder disturbing birds which may otherwise be in (or heading to) a nest.

The remaining feeds should be spread throughout the day, keeping in mind that the majority of a bird's intake will be in the second half of the day. When it comes to maintaining health status in cage-free flocks, the principles applied to more intensive production systems are exactly the same:

- Robust biosecurity;
- Comprehensive vaccination program tailored to any specific challenges on the production site; and
- Maintaining good air quality within a thermally comfortable environment.

There will be additional considerations, however, such as implementing a regular program against internal parasites.

For further information on cage-free management, consult the <u>Alternative Systems Management Guide</u>.



Both brown and white Hy-Line breeds are well-proven in cage-free systems and have an excellent track record. This, combined with the wealth of knowledge from Hy-Line's global technical team, will ensure a switch to cage-free can be a success.

#### Performance Table Hen-Day Std. (%) Hen-Day Actual (%) Mort. Cum. Std. (%) Mort. Cum. Actual (%) Egg Wt. Std. (g) Egg Wt. Act. (g) Feed / Bird Std Feed / Bird Actual Hen-Housed Edds Actua Hen-Housed Eags Std UK Free Range Flock. 32,000 Hy-Line Brown Plus. Hatched August 2022 450 100 90 400 80 350 70 g/day 300 60 eggs/HH 250 5 50 % 200 40 150 100 50 0 Age (weeks)

#### Congratulations Daniel and Trudi!

#### Excellent Cage-Free Performance for UK Producers

Producers Daniel and Trudi Bates of Wales, UK, had a high-performing flock of 32,000 Hy-Line Brown Plus birds. The flock peaked high and early, with excellent persistency. The flock spent 54 weeks over 90% production (29 of which were 95% or above). Due to the Bates' excellent management, livability to 77 weeks was 97.52% vs. the breed standard of 95.5%. Total hen-housed eggs were 378, which is 20 above the midrange standard! Egg mass was

1 kg greater than the standard. The flock was very feed efficient for a free range flock, making an egg per 131 g of feed consumed.





### **New Vitamin and Trace Mineral Recommendations**

Vitamins and trace minerals are critical nutritional components in layer rations. Ensuring their adequate supplementation helps to optimize the health and productivity of laying hens. The significant genetic improvement in productivity and feed efficiency has dictated the need for Hy-Line to update the vitamin and trace mineral recommendations for commercial and parent stock.

varieties Hy-Line produce an additional 15-25 eggs and are even more feed efficient than before. These additional eggs represent some 6-10 additional chicks from breeding hens, resulting in less feed and micronutrients for each settable egg produced. The level of micronutrients fed to highly productive breeders needs to keep pace with this increased output and efficiency, to support reproductive function and optimize the viability of their progeny.

The vitamin specification must not only meet the needs of today's more highly productive female line, but also a more fertile male. These factors must all be considered within the broader context of increasingly challenging environmental and sanitary conditions. As consequence, the levels а of micronutrients have increased in the current parent stock guidelines.

The commercial stock recommended levels also consider the vast genetic improvements producing under more difficult environmental conditions, while respecting the more costsensitive nature of the commercial environment. Consequently, some micronutrient levels have increased

relative to previous recommendations.

This recent update also introduces recommendations for new minerals, like magnesium, which is essential in stress reduction, muscular function, skeleton health, energy metabolism, and protein synthesis. Adequate magnesium levels help support optimal production levels and overall health.

Choline has been excluded from this update, as choline levels (provided in Rearing and Production Period Nutrient Recommendation Tables in the management guides) have been updated to reflect increased productivity of both parent and commercial stocks and the increased demands of extended, single-cycle laying periods.

ITEM 12.3.4	COMMERCIAL LAYERS		PARENT STOCK IN 1000 KG COMPLETE DIET Rearing Period Production Period	
Vitamin D <sub>3</sub> <sup>5</sup> , IU	3,300,000	3,300,000	3,300,000	4,400,000
Vitamin E, g	30.00	25.00	30.00	85.00
Vitamin K (menadione), g	3.50	3.00	4.00	5.00
Thiamin (B1), g	2.20	2.50	3.00	4.00
Riboflavin (B2), g	6.60	5.50	8.00	15.00
Niacin (B <sub>3</sub> ) <sup>6</sup> , g	40.00	30.00	50.00	65.00
Pantothenic acid (B <sub>5</sub> ), g	10.00	10.00	13.00	21.00
Pyridoxine (B <sub>6</sub> ), g	4.50	5.00	6.00	7.00
Biotin (B7), mg	100.00	75.00	120.00	350.00
Folic acid (B <sub>9</sub> ), g	1.00	0.90	1.20	3.00
Cobalamine (B12), mg	23.00	23.00	30.00	35.00
Manganese <sup>7</sup> , g	100.00	100.00	105.00	115.00
Zinc <sup>7</sup> , g	85.00	80.00	100.00	115.00
Iron <sup>7</sup> , g	30.00	40.00	35.00	75.00
Copper7, g	15.00			
Magnesium <sup>7</sup> , g	600.00	ligit seasons	huling og	me to vio
lodine, g	1.50	Visit <u>www</u> .	<u>.rryiine.co</u>	m to vier
Selenium <sup>7</sup> . a		le e sue d'at		and a second a fill

the updated recommendations.

- **5. Metabolic Functions:** Many vitamins and minerals serve as cofactors or regulators in various metabolic pathways. For instance, B vitamins are essential for energy metabolism and the utilization of nutrients from feed.
- 6. Stress Resistance: Layers may encounter various stressors such as environmental changes, handling, or disease challenges. Adequate levels of certain vitamins (like B-complex vitamins) and minerals (like zinc and manganese) help in mitigating the negative effects of stress and maintaining the bird's health and productivity.
- 7. Economic Efficiency: Proper supplementation of vitamins and minerals in layer diets can lead to improved feed efficiency, better growth rates, reduced mortality, and optimal egg production. This translates into better economic returns for poultry producers.

Vitamins and trace minerals are crucial components in layer rations for several important reasons:

- 1. Overall Health Maintenance: Vitamins and minerals play essential roles in maintaining the overall health of laying hens. They are involved in various physiological processes such as growth, reproduction, immunity, and metabolism.
- 2. Egg Production and Quality: Specific vitamins and minerals are directly linked to egg production and quality. For example, vitamin D3 is critical for calcium absorption, which is essential for forming strong eggshells. Vitamin E and selenium are important antioxidants that help protect cell membranes and maintain egg quality.
- 3. Reproductive Performance: Adequate levels of vitamins and trace minerals are necessary for optimal reproductive performance in breeders. This includes fertility, hatchability of eggs, and overall reproductive health.
- 4. Immune Function: Vitamins A, C, D, and E, along with minerals like zinc and selenium, play key roles in supporting the immune system of laying hens. A robust immune system helps prevent diseases and ensures the well-being of the birds.

#### **Hy-Line President Tours Southeast Asia Region**

Southeast Asia is the largest region in the world for egg production, occupying more than 50% of the world's egg production when including China. Due to the importance of this region, it is top of mind at Hy-Line International, including the executive level. This was evident during the recent tour by Hy-Line President Jonathan Cade. Mr. Cade conducted a "listening tour," visiting Hy-Line distributors and market leaders to better evaluate Hy-Line's service to the area.

The tour included China, Taiwan, Indonesia, and Thailand to demonstrate Hy-Line's commitment to the customers of this region.

Indonesia and Thailand are brown egg markets, while Taiwan consumers prefer white eggs. China has a significant, growing tint egg market, but the majority of eggs consumed are brown-shelled. White eggs are still a small minority of the eggs consumed in China at only single-digit share.

Hy-Line continues to prioritize the Asia region with technical assistance and ongoing genetic improvement in the brown, tint, and white lines in the markets. Asia is poised to continue its growth and be the dominant egg production region in the world.



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#### **Hy-Line Africa Seminar**

In May 2024, Hy-Line together with Hybrid Poultry Farms Ltd Zambia, held first Hy-Line Brown Technical the Seminar for Sub-Saharan Africa in Lusaka, Zambia. The successful event welcomed some 80 poultry owners, managers and allied industry VIPs from region to discuss the latest the with developments Hy-Line Brown genetics and relevant topics for the



African industry, such as value creation through genetic improvements, maximizing saleable chicks through management, disease prevention, nutrition, and Hy-Line's vision for the African egg industry. Hy-Line president Jonathan Cade and Hybrid managing director, Richard Keeley kicked off the event by updating the attendees on recent developments and communicating how the companies working together will provide top quality day-old chicks with improved genetic traits to meet African egg farmers' needs. In addition to Hy-Line speakers, the event benefited from the presentations offered by CEVA, EW Nutrition, HIPRA, EmTech, and Urban Farmer as co-hosts of the event.

Africa's egg industry is poised for significant growth over the next decades. The human population will surpass 2 billion people on the continent by 2040, and egg consumption rates will undoubtedly continue to climb as African people demand better protein sources for their daily diet. Africa currently has a very low per-capita egg consumption of less than one egg per person per week, while the world average is around 3-4 eggs per week per person. Just a modest growth in consumption of 2.6 eggs per capita per year would double per-capita consumption by 2040 and together with the population growth would require a near 3-fold increase in layer numbers, even taking into account the expected rate of genetic improvements. The next decades should see world egg production growth focused in Africa with continued growth in Southeast Asia, India, and Latin America.























### Hy-Line Brown Breeder Flock Awards

Top Hy-Line Brown breeder flocks were recognized during the Hy-Line Africa Seminar in Lusaka, Zambia. Hy-Line President Jonathan Cade (second from left) together with Amine El Ghissassi (second from right), Regional Sales Manager to Africa and the Middle East; Sujeewa Lokuwaduge (far left). Technical Manager for Africa; and Tom Dixon (far right), Global Product Manager, presented the companies with plagues to recognize superior Hy-Line Brown breeder performance to (top to bottom): Tanbreed Farm of Tanzania (Patrick Sekayo); Hybrid Farm of Zambia (Aaron Banda); and Kenchic Kenva Farm of (Gorge Muthi). Hy-Line also Inicia Ltee recognized Farm of Mauritius (HarryKrishna Chengan) for submitting the most records from the region to the Hy-Line breeder database.











Employee

Spotlights

On 30 June 2024, Dr. Janet Fulton retired as Director of the Hy-Line Molecular Genetics Laboratory, which she founded and directed for 28 years. The laboratory was the fulfillment of the vision by the Research and Development director at the time of Janet's hiring, Dr. James Arthur.

The lab was a bold step forward as the first in-house molecular genetics laboratory within the primary poultry breeding industry, with the goal of bringing the tools and technologies of molecular genetics into the Hy-Line breeding program. During the past 28 years, under the direction of Dr. Fulton, Hy-Line has defined their genetic stocks at the DNA level, identified unique genetic variation within the stocks, initiated markerassisted selection, and developed SNP chips for application of genomic selection in elite breeding stocks.



These technologies have had a direct impact on the improved performance of commercial egg laying varieties. Dr. Fulton's goals have been to understand the genetic variation present in elite stocks, develop rapid and inexpensive methods to define this variation and subsequently develop practical application of this information.

Today, Hy-Line geneticists are gaining 4 additional henhoused eggs and improving feed efficiency, reducing feed by 5 grams per dozen eggs produced on average annually through production cycles extending to beyond 90 weeks of age. Hy-Line's genomics laboratory has played a key role in this improvement and will drive continued improvement into the future.

In addition to the work Dr. Fulton has accomplished with improving Hy-Line's varieties, her work has yielded tangible benefits to

the overall egg industry and academia.



Dr. Janet Fulton founded the Hy-Line Molecular Genetics Laboratory and served as its director for 28 years.

Dr. Fulton has authored or coauthored more than 110 peerreviewed publications and four book chapters. She has been actively involved with multiple USDA Stakeholders meetings, the **USA National Poultry Improvement** Plan, Poultry Breeders Roundtable, ADOL Poultry Industry Coalition, and the Poultry Science Foundation, and has provided industry-relevant mentoring to both undergraduate and graduate students. Dr. Fulton was the recipient of the Poultry Science Association (PSA) Distinguished Poultry Industry Award in 2016 and this year, she received the PSA's highest honor as a Fellow for her outstanding contributions and service to the field of poultry science.





#### **Dixon Celebrates 30-Year Milestone**

Thomas Dixon celebrated his 30-year anniversary recently, having joined Hy-Line in April 1994. Thomas oversees Global Product Management for Hy-Line International. In this role, he leads the effort to provide and promote the best layer genetics to each market worldwide. experience includes Thomas' many vears of sales worldwide efforts, with emphasis serving Hy-Line's Latin America markets. Today, he leads the global product management efforts as the liaison between Hy-Line International's global customer base and the research, production, and technical service departments to help guide the current and future development of Hy-Line's layer varieties.



#### Sanabria Brings Experience to LATAM and Canada

#### EMPLOYEE SPOTLIGHT MAURICIO SANABRIA BERNAL

Sales & Technical Manager LATAM and Canada

I enjoy working for Hy-Line International because I get to contribute to people's improved nutrition with exceptional food (such as eggs), while getting to know new people and places.



Mauricio Sanabria began working at Hy-Line in 2022 after working many years with an international pharmaceutical company within the poultry sector. As Latin America Commercial and Technical Manager, Mauricio manages the large and very important region of Latin America as well as Canada. Mauricio received his degree as a Veterinarian and Zootechnician in Colombia where his studies specialized in production management. He studied avian medicine at the University of North Carolina (USA) and earned a master's degree in animal sciences at the University of Alberta (Canada).

Mauricio has worked in genetic and animal health companies performing technical, marketing and managerial roles. He has experience managing grandparent stock, heavy and

light breeders, layers and broilers, hatcheries, laboratory quality control, and logistics supply chain management. Recently, Mauricio was appointed president of AMEVEA, the prestigious association of poultry veterinarians in Colombia, which holds informational meetings for the industry and hosts an annual tradeshow.

#### Williams to Lead Molecular Genetics Research

Dr. Travis Williams is the new Molecular Genetics and Genomics Lab Manager at Hy-Line International. He is a recent graduate from the Department of Poultry Science at Texas A&M University in College Station, Texas with a Ph.D. in Poultry Science. Before Travis joined Hy-Line, he was an instructor in the department of Poultry Science at Texas A&M University. His research expertise is in molecular biology, quantitative genetics, and comparative genomics using Next Generation Sequencing (NGS) technologies and cutting-edge bioinformatics. Travis brings a valuable new perspective, and is excited to apply his skill set to the continuous genetic improvement of Hy-Line International laying hens.



Every day brings new opportunities to learn about our genetic lines and how I can support the genetic improvement process.



## Toshkentparranda Marks 15 Years as Hy-Line Distributor in Uzbekistan

the Tashkent Located in territory of Uzbekistan. Toshkentparranda LLC has been recognized for 15 years' service as a distributor of Hy-Line chicks. The company's main focus is commercial egg production, but the company is also vertically integrated into the breeding of day-old chicks. Founded in 1986, the business has recently seen major investment in the shape of a new farm in the Tashkent region. In 2021, despite the



Toshkentparranda owner Miragzam Mirpulatovich Mirsaatov (right) accepts a celebratory plaque from Vitaliy Honcharenko, Hy-Line commercial manager to Eastern Europe.

short time for dismantling and demolishing buildings and clearing the construction site, the company managed to build and put into operation in record time a new high-tech poultry farm which meets the latest international standards.

While the new site does house commercial layers, the focus is the maintenance of the Hy-Line parent stock and the production of day-old chicks through the modern hatchery, which has the capacity to produce five million chicks a year. To provide the poultry on the farms with high quality feed, a feed mill was also constructed and a fully equipped laboratory on site allows daily checks to be carried out to determine the quality of the feed.

The \$8.2M investment is evidence of Toshkentparranda's commitment to egg producers in the region, and they have further

plans to expand parent stock numbers, allowing the company to supply highly productive Hy-Line varieties not farms across only to Uzbekistan, but also to neighboring countries. The hatchery currently produces W-36 and Sonia, and the choice will be expanded next year with the addition of W-80 to provide a full portfolio of white and tint layer options for Uzbeki egg farmers.



Toshkentparranda's high-tech poultry facility opened in 2021.

#### Customer Anniversaries



Agrifarm (Madagascar): 5 Years Plaque presented to Jean Dauphin, Breeder Manager



Fryday Layers (Malawi): 5 Years Plaque presented to Mustafa Issa, Manging Director



Amo Farms (Nigeria): 5 Years Plaque presented to Dr. Sreenivasa Barath, General Manager



Hybrid Poultry (Zambia): 10 Years Plaque presented to Richard Keeley, Group Managing Director and Aaron Banda, Chief Operating Executive



#### Dynamic Growth in GCC Countries

Hv-Line International introduced the Hy-Line W-80 Plus to the Saudi market and the surrounding Gulf Cooperation Council countries (GCC) in January 2019 through an exclusive arrangement with Gulf Layer Breeder Company (GLBCO). This marked the beginning of a successful partnership and contributed to the evolution of the poultry business in Saudi. GLBCO has demonstrated a great commitment to provide the best quality chicks to the customers in Saudi, Oman, UAE, and Kuwait, gaining the trust of the biggest local egg producers. In 5 years, GLBCO increased Hy-Line market share from zero to 27% with a trajectory for continued growth in the upcoming years. This year, they expect to supply over 9 million day-old chicks to the market. GLBCO attributes its rapid growth to offering high-guality chicks with excellent genetic potential supported by technical assistance.



Hy-Line President Jonathan Cade (left) and Amine El Ghissassi, Regional Sales Manager to Africa and the Middle East (second from right), pose with Abdallah Benoah and Abdulrahman Al Suhaibani, co-owners of GLBCO.

### Hy-Line Researchers Recognized for Scientific Contributions

The renowned Poultry Science Association (PSA) recently bestowed their highest honor upon Hy-Line's Dr. Janet Fulton. Dr. Fulton was awarded with a Poultry Science Fellowship for her life's work with poultry genetics, the majority of which related to her work with the chicken genome during her 28 years directing Hy-Line's molecular biology laboratory. Dr. Fulton was recognized at the PSA's annual conference in Louisville, Kentucky, USA in July, 2024.

A fellowship is a type of 'hall of fame' honor for significant contributions to the advancement of poultry science. Dr. Fulton's molecular biology laboratory has been an essential part of the selection process of Hy-Line varieties, making them the most productive and efficient laying hens in the world.

Also during the PSA's annual Dr. Anna Wolc, meeting, Hy-Line International genomic scientist, was recognized by the American Egg Board for part of a recently her published study. The study focused on the importance of the egg cuticle for bacterial growth mitigation within eggs and the effect of a healthy cuticle in promoting higher rate of hatchability. Dr. Wolc identified that cuticle coverage is a heritable trait, meaning that genetic selection can be used to improve the cuticle coverage. This, therefore, improves resistance of eggs bacterial contamination, to improving food safety and also improving hatch rates in the case of fertile eggs.

Hy-Line is proud of the achievements of these researchers, as they work to improve the overall egg supply chain to benefit the end consumer of eggs.





Hy-Line's Dr. Janet Fulton (top, left) and Dr. Anna Wolc (bottom, left) receive their awards at the Poultry Science Association's conference in July.





#### **International Egg Commission Celebrates 60 Years**

This year the International Egg Commission (IEC) is celebrating its 60th anniversary! Since 1964, the IEC has been dedicated to supporting the global egg industry by providing opportunities for collaboration, promoting best practices, and driving innovation.

For six decades, the IEC has played a crucial role in uniting egg producers, processors, and stakeholders from around the world. Their commitment to excellence has helped elevate industry standards, enhance sustainability, and ensure the highest quality of egg production. The IEC takes pride in the collective achievements of their global community and extends their gratitude to their member companies for their support, partnership, and dedication.



### Hy-Line Shares Technical Expertise with US Visitors

In June, Hy-Line had the honor of hosting 90 U.S. commercial managers, veterinarians. egg and nutrition experts in central lowa as part of Hy-Line North technical America's school. Hy-Line International technical and research staff alongside Hy-Line North America technicians various presented on topics. including nutrition, egg quality, genetic improvements, and lighting at Hy-Line's Dallas Center campus, as well as the Iowa State University Feed Mill.

Global Technical Services Manager Vitor Arantes explained new vitamin and trace mineral recommendations along with phase feeding program for а Hy-Line varieties. Dr. Kaylee Rowland shared genetic improvements in egg quality which drive Hy-Line varieties to match market demands of birds through long 100-week cycles.

These include maintaining strong shells; optimizing egg shell color; and the measurement process that supports Hy-Line's industryleading internal egg quality. **Diagnostics Laboratory manager** Stephanie Schultzen discussed the testing done on Hy-Line and customer flocks for maintaining and health status. supporting top Dr. Ian Rubinoff and Darrin Eckard Hy-Line North America of presented the science of the chicken's ability to perceive different day lengths, color, and intensity of lighting, and how it affects productivity and egg weight profiles.

Hy-Line values these customer interactions as the valuable feedback assists us to adjust our approach and properly apportion trait selection emphasis to continue to provide the laying hens which most closely match environmental the conditions field and in the

mer requirements



*Dr. Ian Rubinoff and Darrin Eckard led a lighting lab demonstration.* 



Technical School attendees visited the lowa State University Feed Mill.



Stephanie Schultzen explained the Diagnostic Lab's testing capabilities.

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